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INSTRUCTION MANUAL

MODEL P-860

KAY ELECTRIC CO.
PINE BROOK, N. J.

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SWEEPING OSCILLATOR

PLUG-IN UNIT

MODEL P-860

Issue A

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KAY ELECTRIC COMPANY
Pine Brook, New Jersey
CApital 6-4000

INTRODUCTION.

Model P-860 is a sweeping oscillator plug-in unit designed for use with the Vari-Sweep Model 860-D. All operating signals and power for the P-860 is provided by the 860-D. The frequency range of 2 to 215 mc is covered in 12 bands, with sweep widths variable up to 30 mc. Major circuitry consists of a sawtooth amplifier, oscillator circuits and an agc detector. (Schematic D-7367A).

OPERATION.

An operating procedure is provided here as a guide for general application, the main purpose of which is to illustrate the use of the Vari-Sweep 860-D in conjunction with the P-860 plug-in. If maximum utility is to be obtained from the instrument, deviations from this procedure will be necessary, according to the measurements being made and the type of equipment being tested. The operator should become familiar with the function of all operating controls.

Allow several minutes warm-up time to stabilize the circuits after the ON - OFF switch has been set to ON. For most applications, the interconnection diagram shown in Fig. 1 may be used. The SWEEP SELECTOR switch should be set to the desired mode of operation. The Band Selector switch and the Center Frequency control should be set to the center frequency of the pass-band of the equipment being tested. The SWEEP WIDTH control is usually adjusted to provide about three times the width of the pass-band of the tested equipment. The RF LEVEL control and attenuator may be used to adjust the amplitude of the output signal.

SPECIFICATIONS.

Frequency Range: 2 to 215 mc in 12 bands.

Output: 1 volt rms.

Flatness: $\pm$0.5 db over each band.

Sweep Width: 30 mc, with center frequencies above 50 mc;
60% of center frequency, with center frequencies below 50 mc.

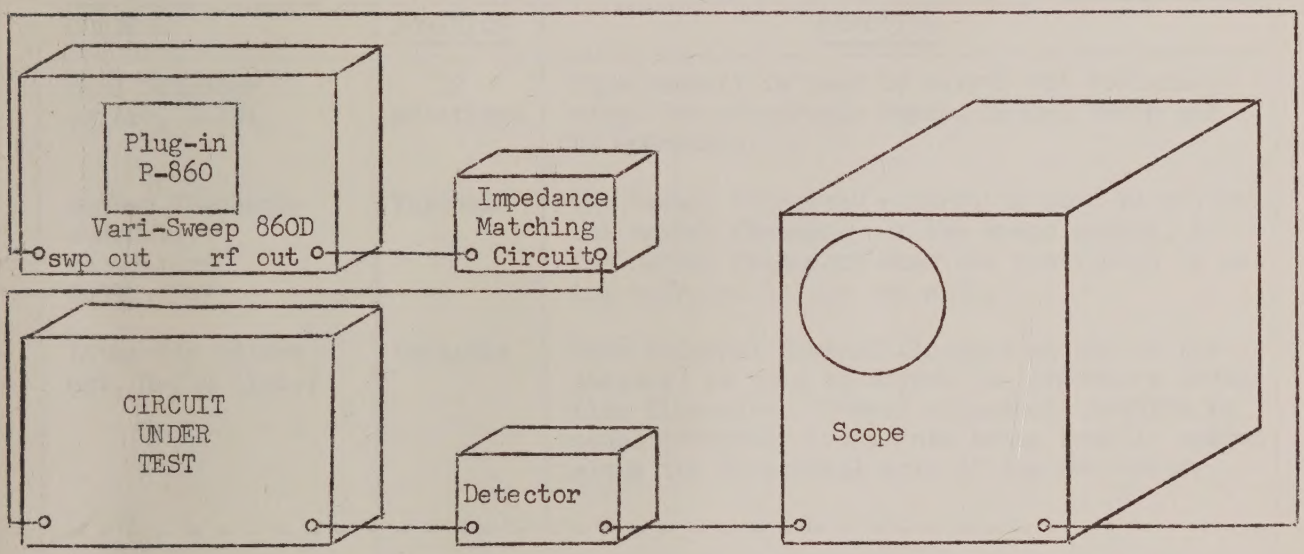
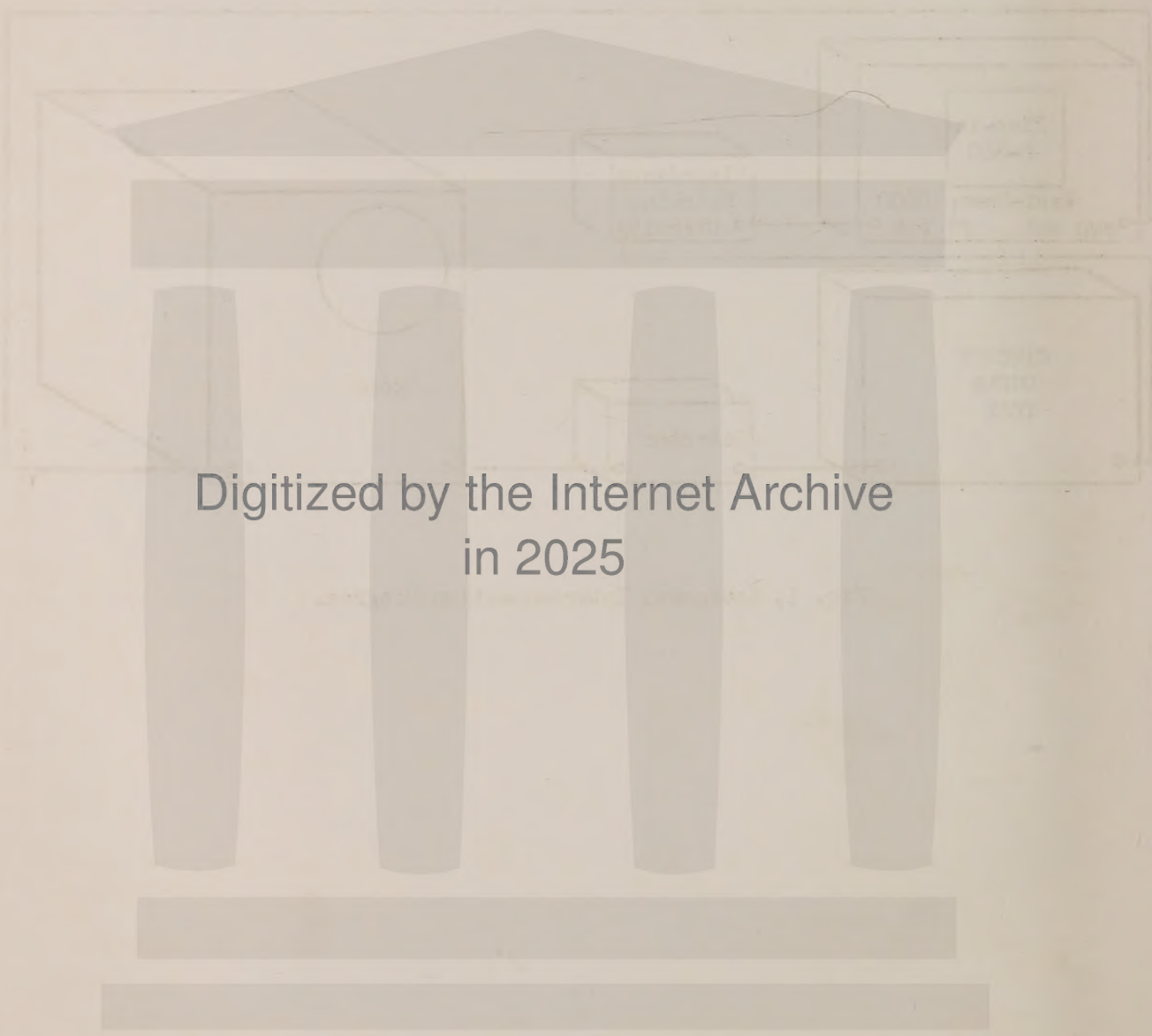


Fig. 1, Equipment Interconnection Diagram.



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CONTROLS AND TERMINALS.

CONTROL	POSITION	FUNCTION
Band Selector switch, S-301	12 positions	This control is used to select the frequency range for electronic sweep, Manual Sweep and CW operation.
Center Frequency control, capacitors C-314, 315	Variable	The Center Frequency control is used to adjust the center frequency of the swept output, or the output frequency when the instrument is being operated in the c-w mode.
Linearity Adjust pot, R-334 (int.)	Variable	This internal control (located on top of the chassis) is used to adjust the frequency deviation linearity. Proper adjustment results in equal frequency increments being equally spaced along the horizontal axis of the CRO trace.

TERMINAL	FUNCTION
Marker RF Out jack, J-5.	An rf signal, of the same frequency as that appearing at the RF OUT jack on the Vari-Sweep 860-D, is available at this jack. A connection is normally provided between J-5 on the P-860 and the input terminal on an auxilliary marker generator, such as the Kay Vari-Marker Model F to produce a variable marker.

CIRCUIT DESCRIPTION.

The basic circuits of the P-860 consist of a sawtooth amplifier, r-f oscillator and agc detector. The sawtooth generator, agc amplifier and control stages, attenuator and gain control, plus power supply, are contained in the rack units which accept the P-860 plug-in. Circuitry for the P-860 is shown on Schematic D-7367A.

The sawtooth signal (developed by the sweep generator circuits in the 860-D rack unit) is amplified by sawtooth amplifier V-301. This sawtooth signal is then used to vary the current through saturable reactor L-303, since it is in series with the plate supply for V-301. The inductance of the oscillator tank coils, L-304 thru L-315, changes in accordance with the current through L-303, thus changing the frequency of oscillators V-302, V-303.

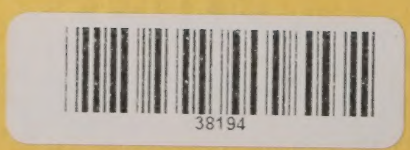
A negative blanking pulse, taken from diode D-1, is applied to the grids of the oscillators to turn them off during sweep retrace time, thus producing a zero-voltage reference baseline on the CRO.

The output signal from the plug-in is sinusoidal and varies in frequency (swept) as determined by the current through V-301, and the instantaneous inductance of the oscillator tank coils. Output is taken from the pick-off loops (B) and applied to the output circuits through J-4.

Automatic gain control is achieved by taking a sample of the output signal available at J-4 and coupling it through R-346 to a voltage-doubler detector circuit composed of diodes D-303, D-304 and capacitors C-312, C-313. The resultant rectified voltage is applied to the grid of agc amplifier V-3, amplified, and d-c coupled to the grids of parallel-connected cathode-follower output stage V-4. The voltage appearing at the cathodes of V-4 is used as the plate voltage for oscillators V-302, V-303, providing a servo-loop to maintain signal output steady.

When the manual sweep mode is used, current through saturable reactor L-303 is varied in accordance with the setting of the Manual Sweep control (R-38) due to the d-c coupling. The frequency range of the Manual Sweep control is determined by the setting of Sweep Width control R-40, the range selected by the Band Selector, and the setting of the Center Frequency control.

During c-w operation, the sweep generator circuits are inactive, and a steady current flows through the saturable reactor and V-301, permitting the oscillator (V-302, V-303) to oscillate at a frequency determined by the plate tank coil in the circuit, and the setting of the Center Frequency control (C-314A, C-315A).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